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STOPPING
WATER POLLUTION
AT ITS SOURCE

MISA
Municipal/Industrial Strategy for Abatement

ACUTE LETHALITY DATA
FOR ONTARIO'S
INORGANIC CHEMICAL SECTOR EFFLUENTS

Covering the Period from
June 1990 to November 1990

Ontario

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ACUTE LETHALITY DATA FOR ONTARIO'S INORGANIC CHEMICAL MANUFACTURING SECTOR EFFLUENTS

COVERING THE PERIOD FROM JUNE 1990 TO NOVEMBER 1990

OCTOBER 1993

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ACUTE LETHALITY DATA FOR ONTARIO'S INORGANIC CHEMICAL SECTOR EFFLUENTS - COVERING THE PERIOD FROM JUNE 1990 TO NOVEMBER 1990

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Introduction

Under the MISA program, the Inorganic Chemical Sector was required to monitor its discharges (both process and cooling waters) for acute lethality to trout and to *Daphnia magna* by conducting laboratory toxicity tests. Specific details on the toxicity testing requirements may be found in the General Effluent Monitoring Regulation (Ontario Regulation 695/88) and the Effluent Monitoring Regulation For The Inorganic Chemical Sector (Ontario Regulation 395/89). For the purposes of the Monitoring Regulation, the Inorganic Chemical Sector is defined to include all direct discharging plants, primarily engaged in the processing, manufacturing, packaging or blending of inorganic materials. The majority of the plants are located in southern Ontario. The products of the Inorganic industry include acids and bases, caustic soda, soda ash, fertilizers, explosives, carbon black, detergent additives, bleaches and industrial gases. Some of these are used as ingredients to manufacture other commercial products such as dyes, plastics and pharmaceutical. An overview of the sector is described in the publication "The Development Document For The Effluent Monitoring Regulation For The Inorganic Chemical Sector, Env. Ontario July 1989".

Toxicity information collected under the MISA effluent monitoring program will form the most comprehensive database available on the Inorganic Chemical Sector and will be used toward the development of compliance limits for acute toxicity. This report presents the toxicity results of the second six months of self-monitoring, from June 1, 1990 to November 30, 1990, along with the results of Ministry inspection samples that were tested at the Ministry's laboratory in Rexdale. Toxicity tests of some intake waters were also submitted by industry and these have been included in this report. The results of toxicity testing for the first six months of industry monitoring were reported in " Acute Lethality Data For Ontario's Inorganic Chemical Sector Effluents Covering The Period From December 1989 To May 1990, Env. Ontario 1992 ". Although this report is focused on the second six months of monitoring, the Conclusion section does provide a brief overview on the complete year of monitoring.

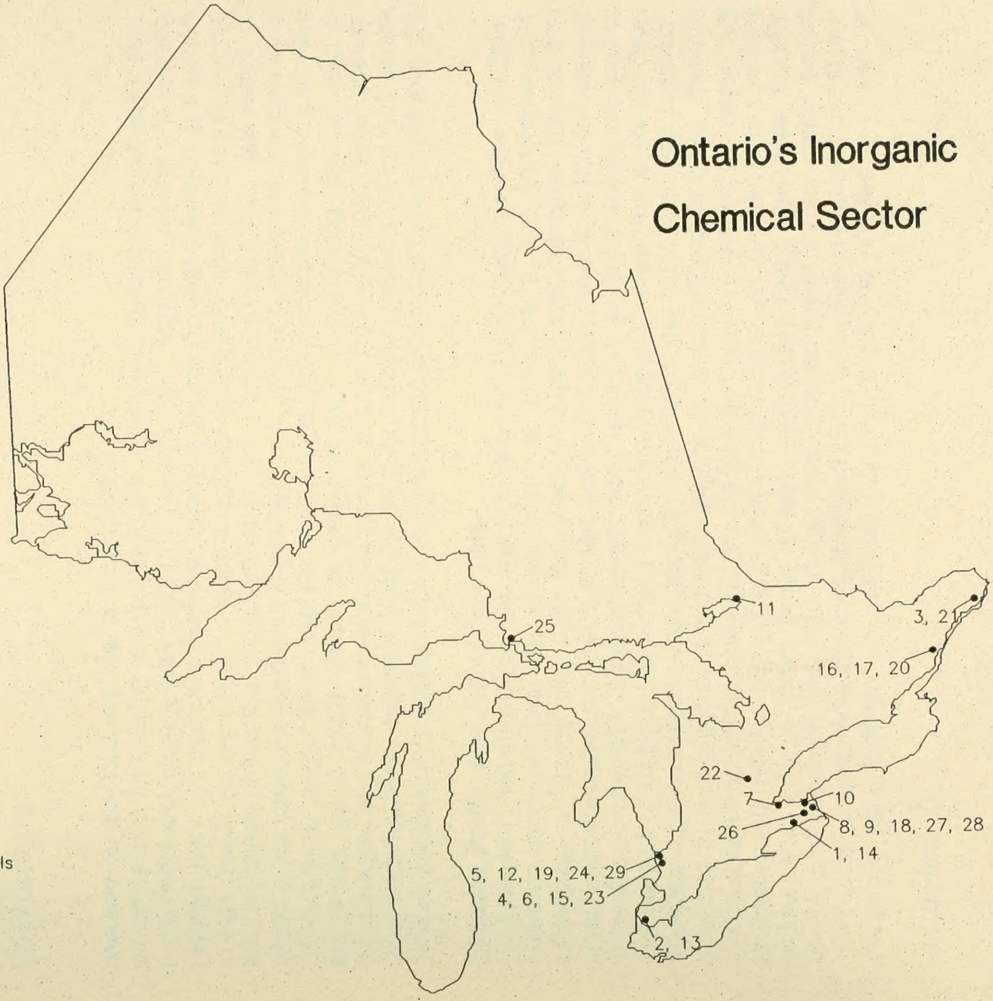
Background

In general, toxicity tests are used as a rapid technique to assess the potential impact of complex effluents on the aquatic environment. The tests have been designed to answer whether or not an effluent produces an effect on a biological system and the degree of the measured effect. In acute lethality testing, aquatic organisms are exposed to undiluted effluent, and several effluent dilutions, for a fixed period of time. The toxicity test protocols require a 96 hour exposure for trout and a 48 hour exposure for *Daphnia*. For both tests, the number of organisms which have died is the measured parameter. The LC50 or the estimated concentration of effluent that causes 50 % mortality is generally used as the quantitative measure of toxicity. For complex waste water samples, the LC50 measurement is usually expressed as a percentage of effluent volume. For example, a 96

Ontario's Inorganic Chemical Sector

No. Name : Location

1. Albright and Wilson Americas In.,Port Maitland
2. Allied Chemicals Canada Inc., Amherstburg
3. CIL Inc., Cornwall
4. CIL Inc., Courtright
5. Cabot Canada Ltd., Sarnia
6. Canadian Liquid Air Ltd., Courtright
7. Columbian Chemicals Canada Ltd., Hamilton
8. Cyanamid Canada Inc., (Niagara Plant) Niagara Falls
9. Cyanamid Canada Inc.(Welland Plant) Niagara Falls
10. Exolon–Esk Company of Canada Ltd., Thorold
11. Explosive Technologies Int. Ltd., North Bay
12. Fiberglas Canada Inc., Sarnia
13. General Chemicals Ltd., Amherstburg
14. International Minerals & Chemicals, Port Maitland
15. Liquid Carbonic Inc., Courtright
16. Liquid Carbonic Inc., Maitland
17. Nitrochem Inc., Maitland
18. Norton Canada Inc., Niagara Falls
19. Partek Insulations Ltd., Sarnia
20. Puritan Bennett Canada Ltd., Maitland
21. Stanchem, Cornwall
22. Sulco Chemicals Ltd., Elmira
23. Union Carbide Canada Ltd., Moore TWP
24. Union Carbide Canada Ltd., Sarnia
25. Union Carbide Canada Ltd., Sault Ste. Marie
26. Union Carbide Inc., Welland
27. Washington Mills Electro Minerals, Niagara Falls
28. Washington Mills Ltd., Niagara Falls
29. Welland Chemical Ltd., Sarnia



hour LC50 = 35 % can be explained as the percent by volume of effluent required to kill 50 % of the test fish within a 96 hour exposure period. LC50 percentages are inversely related to the degree of toxicity; lower numbers representing greater effect. Effluent samples where no animals die in full strength (100 %) effluent or in any of the diluted concentrations are considered non-lethal. Non-lethal effluents are considered less likely to produce adverse impacts in the environment after dilution. For bioassays where less than half the test animals die in full strength effluent, and the data does not support the calculation of an LC50, the acute lethality is usually reported as "LC50 > 100 % ". This designation indicates that mortalities occurred during the test, but the LC50 cannot be accurately calculated from the data and is probably greater than full strength effluent.

As directed by the Effluent Monitoring Regulation, the Inorganic Chemical Sector was required to collect and provide information on its operations including analytical chemical characterization and toxicity analysis of its waste water discharges. The timing of toxicity sampling was arranged as much as possible to coincide with chemical characterization. The frequency of sampling was monthly for both toxicity test procedures on process effluents with the exception that if trout tests showed insignificant mortalities over three consecutive months then in subsequent months a single concentration trout test may be used. For cooling water effluent, the required frequency of sampling and testing was quarterly. All acute lethality testing by the Sector plants were conducted according to Ministry protocols (Protocol To Determine The Acute Lethality Of Liquid Effluents To Fish, Env. Ontario, July 1983 and *Daphnia magna* Acute Lethality Toxicity Test Protocol, Env.Ontario, April 1988). The regulations also required specific information on sampling and testing procedures for each bioassay, in addition to the mortality data. All data was reported in an electronic and hardcopy report. The Ministry's TOXDATA computer program was provided to industry as a method of managing toxicity data and as a route for data submission. Additional information on this computer program is provided in the publication titled " Toxicity Relational Database System TOXDATA User's Manual, Env. Ontario, May 1989".

Discussion

General

The Inorganic Chemical Sector plants submitted data for 42 sampling locations at a total of 26 plants for the second six months of monitoring. Starting in June 1990 and ending November 1990, a total of 388 trout and *Daphnia* toxicity test results were submitted by the plants. An additional 40 inspection tests were conducted by the Aquatic Toxicity Unit of Environment Ontario.

Liquid Carbonic Inc. (Courtright), Liquid Carbonic Inc. (Maitland), Puritan Bennett Canada Ltd. (Maitland), Union Carbide Canada Ltd. (Moore Twnshp), Union Carbide Canada Ltd. (Sarnia), and Union Carbide Canada Ltd. (Sault Ste. Marie) were all brought under monitoring through regulation amendments after initial promulgation date. Therefore, acute toxicity data submitted beyond November 1990, for these plants, have been included in this report. Three companies, Allied Chemicals Canada Inc., Canadian Liquid Air Ltd., and Columbian Chemicals were not required to monitor for acute toxicity during the Monitoring Regulation period. These plants were considered exempt from acute toxicity monitoring since they did not discharge process effluent directly into the natural environment. Albright and Wilson Americas Inc. and General Chemical Canada Ltd. voluntarily submitted test results for acute toxicity tests conducted on intake water samples.

The data collected during this six months of monitoring indicated that the majority of the inorganic chemical sector's effluents were not acutely lethal. Over 88 % of the samples tested for trout acute lethality and 77 % of the samples tested for *Daphnia* acute lethality were non-lethal or had insignificant mortalities (LC50s > 100 % effluent). Most of the samples that were acutely lethal to trout and/or *Daphnia* originated from sites at the following seven plants: Cyanamid Canada Inc.(Welland plant), General Chemical Canada Ltd., Nitrochem Inc., Partek Insulations Ltd., Puritan-Bennett Canada Ltd., Union Carbide Canada Ltd.(Sarnia plant), and Welland Chemical Ltd. All these plants reported that one or more of their discharges were acutely lethal to *Daphnia* and/or trout, at least 50 % of the time when sampled.

Trout Test Results

Of the 193 samples that were tested for acute toxicity to trout, 144 (74.6 %) were not acutely lethal. The effluent samples collected from 7 of the 26 plants were consistently not acutely lethal. Companies included in the non-lethal effluent category were : Exolon-Esk Company of Canada Ltd., Explosive Technologies Int. Ltd., ICI Canada Inc.(Courtright), International Minerals & Chemicals, Sulco Chemicals Ltd., Washington Mills Electro Minerals and Washington Mills Ltd. An additional 27 samples, 11.4 % of total, resulted in LC50s > 100 %. Many of these tests had only one fish die during the test and may be interpreted as being not acutely lethal. Nine plants submitted data that showed their effluent samples were either non-lethal or had LC50s > 100 % throughout this six month period. This category included the following companies : Albright and Wilson Americas Inc., Cabot Canada Ltd., Fiberglas Canada Inc., Liquid Carbonic Inc.(Maitland plant), Stanchem, UCAR Carbon Canada Ltd., Union Carbide Canada Ltd.(Moore Twp), Union Carbide Canada Ltd.(Sarnia), and Union Carbide Canada Ltd.(Sault Ste. Marie).

Twenty-two samples, 11.4 % of the total number of samples tested, were acutely-lethal to trout (96 hour LC50 <100 %). All of the acutely lethal results were submitted by the following ten plants :Cyanamid Canada Inc.(Niagara Falls plant), Cyanamid Canada Inc.(Welland plant), General Chemical Canada Ltd., ICI Canada Inc.(Cornwall), Liquid Carbonic Inc.(Courtright), Nitrochem Inc., Norton Canada Inc., Partek Insulations Ltd., Puritan-Bennett Canada Ltd., and Welland Chemical Ltd.

Daphnia magna Test Results

Of the 195 samples tested for acute toxicity to *Daphnia magna*, 116 samples (59.5 %) were not acutely lethal. The effluent samples from three plants, Exolon-Esk Company of Canada Ltd., Explosive Technologies Int. Ltd., and ICI Canada Inc.(Courtright) were consistently not acutely lethal to *Daphnia* throughout the second six months of monitoring. An additional 35 samples (17.9 %) had 48 hour LC50s >100 %. Many of these samples had only one neonate die during the test, and might be interpreted as being not acutely lethal. Seven plants have one or more test results with an LC50 > 100 %. Included in this category were : Cyanamid Canada Inc.(Niagara plant), Liquid Carbonic Inc.(Maitland), Norton Canada Inc., Sulco Chemicals Inc., UCAR Carbon Canada Inc., Washington Mills Electro Minerals and Washington Mills Ltd.

Forty-four samples (22.6 %) were acutely lethal to *Daphnia* (48 hour LC50s < 100 %). The following sixteen plants reported that during this second six months of monitoring, one or more of their effluent samples was acutely lethal to *Daphnia*: Albright and Wilson Americas Inc., Cabot Canada Ltd., Cyanamid Canada Inc.(Welland plant), Fiberglas Canada Inc., General Chemical Canada Ltd., ICI Canada Inc.(Cornwall plant), International Minerals and Chemicals, Liquid Carbonic Inc.(Courtright plant), Nitrochem Inc., Partek Insulations Ltd., Puritan-Bennett Canada Ltd., Stanchem, Union Carbide Canada Ltd.(Moore Twp plant), Union Carbide Canada Ltd.(Sarnia plant), Union Carbide Canada Ltd.(Sault Ste. Marie), and Welland Chemical Ltd.

Conclusions

In general, the reporting of toxicity data by the industries went smoothly. The data was usually submitted accurately and according to schedule. Where the Ministry requested industry for data resubmission to correct data entry errors and/or for additional information, the companies complied. Where Ministry audit samples were collected and tested, the results were consistent with results submitted by industry.

The full year of MISA acute toxicity data for the Inorganic Chemical Sector indicated that the majority of inorganic chemical plant effluent samples were not acutely lethal. Although the majority of the samples were non-lethal, only a few companies could report that their effluents were non-lethal every time when tested. Only four of the twenty-six plants which submitted acute trout toxicity data had non-lethal effluents throughout the full year of monitoring. None of the plants were able to report their effluents were consistently non-lethal to *Daphnia* throughout the year. Overall, the effluents were more toxic to *Daphnia* than to rainbow trout. For the second six months of monitoring, twice as many plants reported Daphnia toxicity as did trout toxicity.

Over the full year, eight plants; Cyanamid Canada Inc.(Welland plant), General Chemical Canada Ltd., ICI Canada Inc., Nitrochem Inc., Partek Insulations Ltd., Puritan-Bennett

Canada Ltd., Union Carbide Canada Ltd.(Sarnia) and Welland Chemical Ltd. were in the category where at least 50 % of the samples collected from a discharge were lethal to *Daphnia* and/or trout.

For several of the toxic samples, a quick review of the matching analytical chemistry monitoring data has revealed some probable causes of the observed acute toxicity. Where this was possible, a brief explanation to the probable causes of toxicity are described below. The toxicity tests will detect harmful concentrations of chemical constituents in the effluents. Compliance with "end of pipe" limits for acute toxicity does not necessarily control the potential effects of environmental contamination that can be caused by loading of bioaccumulative substances. These substances are generally non-polar organic chemicals of high molecular weight and low water solubility or metals that can be accumulated in their organic form. For this industrial sector, several of these contaminants have been measured in some effluents at sublethal concentrations. This list includes dioxins, octachlorostyrene, hexachlorobenzene, lead, cadmium and mercury.

Cyanamid Canada Inc.,(Welland plant), Niagara Falls

Cyanamid Canada Inc. manufactures inorganic nitrogen and phosphorous products and discharges the wastewater into the Niagara River via Thompson's Creek and the Welland River. The Miller Creek discharge, during the second six months of monitoring , was consistently lethal to *Daphnia* and occasionally to trout. It is unclear at present to the causes of lethality. Cyanamid Canada Inc. has undertaken a study to evaluate all sources of toxicity at this site.

General Chemical Canada Ltd., Amherstburg

General Chemical Canada Ltd. produces soda ash (sodium carbonate) from common salt and the wastewater from the plant is discharged into the Detroit River via the Main Drain and North Drain. The North Drain is also used to discharge wastewater from the Genetron and Hydrofluoric acid plants operated by Allied Chemicals Canada Inc. The effluent samples from the Main Drain were consistently non-lethal to *Daphnia magna* and trout while the North Drain effluent samples were consistently acutely lethal to both species. For the year of monitoring, the trout bioassay LC50s ranged from 20 % to 40 % effluent, while all the Daphnia LC50s were reported as less than 10 % effluent. The alkaline condition of the North Drain wastewater could alone account for the lethal response reported in the bioassays. The pH measurements for the North Drain effluent were consistently above 11.5 on days when toxicity samples were collected. Usually water with a pH greater than 10.5 would be acutely lethal to both *Daphnia* and trout. General Chemical's effluent also contained very high concentrations of chloride ions, as much as 47,900 ppm. Chlorides are found in practically all natural waters and are not usually considered a hazardous contaminant. However, the amount of chloride discharged at this site are well above levels which would kill fish and would have contributed to the lethality observed in the bioassays.

Nitrochem Inc., Maitland

Nitrochem Inc. manufactures ammonia, nitric acid, ammonium nitrate and other nitrogen solutions. Nitrochem's wastewater is discharged directly into the St. Lawrence River. The final effluent was consistently acutely lethal to *Daphnia magna* and trout throughout the year of monitoring. Un-ionized ammonia (NH_3) concentrations in the discharge 0400 were above 50 ppm for several of the days when samples were lethal and would have contributed to the acute toxicity. Cyanide concentrations (12 month average 321 ppb) measured in the 0400 discharge may have also contributed to the observed toxicity.

Partek Insulations Ltd., Sarnia

Partek Insulations Ltd. manufactures insulation fibre and discharges its wastewater into the St.Clair River. The effluent samples collected from the C Water Overflow were consistently acutely lethal to *Daphnia* and trout. The cooling water overflow effluent is straight-through non-contact city water and the probable cause of lethality is the chlorine present in the supply.

Union Carbide Canada Ltd., Sarnia

Union Carbide Canada Ltd. manufactures nitrogen gas and discharges its wastewater into the St. Clair River. The effluent samples collected from the Cole Drain were consistently lethal to *Daphnia magna* and only lethal to trout in one test throughout the year of monitoring. For several of the samples, the copper (12 month average 134 ppb) and zinc (12 month average 454 ppb) concentrations exceeded levels known to be acutely lethal and could have contributed to the lethality observed in the bioassays.

Welland Chemicals Ltd., Sarnia

Welland Chemicals Ltd. manufactures anhydrous aluminum chloride, sodium hypochlorite, and packages chlorine gas. The plant's wastewater is discharged through several sewers into the St.Clair River via the Talford Creek. The effluent samples collected from the South Lagoon discharge point were consistently lethal to *Daphnia* and trout throughout the year of monitoring. It is suspected the high levels of aluminum (12 month average 3710 ppb), and cadmium (12 month average 4.2 ppb) discharged in this effluent could have contributed to the acute lethality observed in the bioassays.

The data in the Appendix, presents the summaries of the acute lethality results, grouped by company in alphabetic order. These summary pages are part of the complete database, that includes the Toxicity Test Report submitted by industry for each test sample. The complete database is available from Environment Ontario upon request. The results of Ministry inspection tests are also presented in the individual summaries. The comment fields on individual Toxicity Test Reports were entered by the industry's laboratory performing the tests, and may not to be consistent across samples and may not necessarily represent the views of the Ministry.

Appendix

COMPANY: Albright and Wilson Americas Inc., Port Maitland (1810001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final discharge effluent samples collected between June 1990 and Novemeber 1990, were provided by Albright and Wilson Americas Incorporated. Three of the six effluents samples were not acutely lethal to test fish. The other three samples had 96 hour LC50s > 100 % effluent.

Final Discharge

```
06900738  sampled: 06/13/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900915  sampled: 07/11/90     LC50:  >100  %
  95% fid. limits:     0.0 -    0.0 %
  comments: 10% MORTALITY IN 100% TEST CONCENTRATION.

06901159  sampled: 08/15/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901418  sampled: 09/12/90     LC50:  >100  %
  95% fid. limits:     0.0 -    0.0 %
  comments: 40% MORTALITY IN 100% TEST CONCENTRATION.

06901632  sampled: 10/09/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901896  sampled: 11/14/90     LC50:  >100  %
  95% fid. limits:     0.0 -    0.0 %
  comments: 30% MORTALITY IN THE 100% CONCENTRATION
```

Intake Water

```
06900740  sampled: 06/13/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900917  sampled: 07/11/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901161  sampled: 08/15/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: NO MORTALITY OF SUBLETHAL IMPAIRMENT OBSERVED
```

Albright and Wilson Americas Inc. (continued)

06901416 sampled: 09/12/90 LC50: 87.3 %
95% fid. limits: 65.0 - 100.0 %
comments: 80% MORTALITY IN 100% TEST CONCENTRATION.

06901630 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901898 sampled: 11/14/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

COMPANY: Albright and Wilson Americas Inc., Port Maitland (1810001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Final Discharge (0100) were submitted by Albright and Wilson Americas Inc. of Port Maitland. Five of six samples of Final Discharge were not acutely lethal to Daphnia. The November sample was acutely lethal to Daphnia and had a LC50 of 77.9 %.

Final Discharge

06900739 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900916 sampled: 07/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901160 sampled: 08/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901419 sampled: 09/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901633 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901897 sampled: 11/14/90 LC50: 77.9 %
95% fid. limits: 72.9 - 83.1 %
comments: 10% MORTALITY IN THE 65% CONCENTRATION

Intake Water

06900741 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900918 sampled: 07/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901162 sampled: 08/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Albright and Wilson Americas Inc. (continued)

```
06901417  sampled: 09/12/90     LC50:       80.6 %
  95% fid. limits:   65.0 - 100.0 %
  comments: 100% MORTALITY IN 100% TEST CONCENTRATION.

06901631  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901899  sampled: 11/14/90     LC50:       57.0 %
  95% fid. limits:   50.0 -  65.0 %
  comments: 100% MORTALITY IN THE 65% CONCENTRATION
```

COMPANY: Cabot Canada Ltd., Sarnia
(4260006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on control point #100 discharge samples collected between June 1990 and November 1990, were provided by Cabot Canada Ltd. Four of the six samples were not acutely lethal to the test fish. The other two samples had 96 hour LC50s > 100 % effluent.

Discharge

05900133 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900154 sampled: 07/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900170 sampled: 08/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01900181 sampled: 08/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

05900194 sampled: 09/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900204 sampled: 10/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

05900213 sampled: 11/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Cabot Canada Ltd., Sarnia
(4260006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Discharge Effluent (0100) were submitted by Cabot Canada Ltd. of Sarnia. One of the six samples was acutely lethal to Daphnia and had a LC50 of 79.0 %. Three of the remaining samples were non-lethal and the other two had LC50s of > 100 % effluent. A sample collected and tested by the Ministry in August was acutely lethal with a LC50 of 56.6 %.

```
Discharge

 05900133  sampled: 06/13/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 05900154  sampled: 07/11/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 05900170  sampled: 08/08/90      LC50:   >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 02900182  sampled: 08/21/90      LC50:       56.6 %
   95% fid. limits:    44.1 -  69.4 % slope:      6.9
   comments: MISA Audit

 05900194  sampled: 09/12/90      non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 05900204  sampled: 10/10/90      LC50:   >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 05900213  sampled: 11/14/90      LC50:       79.0 %
   95% fid. limits:     0.0 -   0.0 %
   comments:
```

COMPANY: Cyanamid Canada Inc.(Niagara plant), Niagara Falls (1550003)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for 18 trout bioassays, conducted on samples of Hydro Canal effluent, cooling pond overflow, and south fork sewer effluent collected between June 1990 and November 1990, were provided by Cyanamid Canada Incorporated. All the samples collected from the Hydro Canal were non-lethal. Five of the six samples from the South Fork Sewer were non-lethal and the remaining had a LC50 of > 100 %. Five of six Cooling Pond Overflow samples were non-lethal. The July sample was acutely lethal to fish with a LC50 of 78.6 %.

Whitty Creek Final Effl

Effluent to Hydro Canal

03900499 sampled: 06/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900602 sampled: 07/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900715 sampled: 08/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900830 sampled: 09/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900908 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non Lethal; single concentration test

03901028 sampled: 11/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

cooling pond overflow

03900501 sampled: 06/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Cyanamid Canada Inc.(Niagara plant) (continued)

```
03900600  sampled: 07/17/90     LC50:       78.6 %
  95% fid. limits:   57.2 - 108.0 % slope:     3.6
  comments:

03900716  sampled: 08/21/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900829  sampled: 09/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900909  sampled: 10/16/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non Lethal

03901029  sampled: 11/27/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

south fork sewer

03900500  sampled: 06/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900601  sampled: 07/17/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900714  sampled: 08/21/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Conc. Test; 5% mort. @100% effl. conc.

03900828  sampled: 09/19/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration test; non-lethal

03900910  sampled: 10/16/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non Lethal; single concentration test

03901030  sampled: 11/27/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

COMPANY: Cyanamid Canada Inc.(Niagara plant), Niagara Falls (1550003)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results from eighteen Daphnia magna acute lethality toxicity tests conducted on samples from three separate outfalls were submitted by Cyanamid Canada Inc. (Niagara Plant) of Niagara Falls. Five of six samples from Effluent to Hydro Canal were not acutely lethal to Daphnia, and the remaining sample had 48 h LC50 > 100%. Five of the six cooling pond overflow samples were not acutely lethal to Daphnia and the remaining sample had a LC50 of > 100 %. Four of the six South fork sewer samples were not acutely lethal to Daphnia and the remaining samples had a LC50 of > 100 % effluent.

Whitty Creek Final Effl

Effluent to Hydro Canal

03900499 sampled: 06/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900602 sampled: 07/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900715 sampled: 08/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900830 sampled: 09/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900908 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03901028 sampled: 11/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Cyanamid Canada Inc.(Niagara plant) (continued)

```
cooling pond overflow

 03900501  sampled: 06/19/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: LC50 >100

 03900600  sampled: 07/17/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non lethal

 03900716  sampled: 08/21/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03900829  sampled: 09/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03900909  sampled: 10/16/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03901029  sampled: 11/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

south fork sewer

 03900500  sampled: 06/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03900601  sampled: 07/17/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: LC50 >100

 03900714  sampled: 08/21/90     LC50:  >100  %
   95% fid. limits:    0.0 -   0.0 %
   comments: LC50 >100

 03900828  sampled: 09/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03900910  sampled: 10/16/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03901030  sampled: 11/27/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal
```

COMPANY: Cyanamid Canada Inc.(Welland plant), Niagara Falls (1550102)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for ten trout bioassays, conducted on Miller's Creek effluent and Dicy cooling water effluent samples collected between June 1990 and November 1990, were provided by Cyanamid Canada Incorporated. Five of six Miller's Creek samples were non-lethal to test fish. The other sample was lethal with a LC50 of 90.6 %. Also a sample collected and tested by the Ministry in September was acutely lethal and had a 96 hour LC50 of 70.8 %. All three Dicy cooling water samples were non-lethal.

Millers Cr

```
 06900771  sampled: 06/18/90     LC50:      90.6 %
   95% fid. limits:     0.0 -   0.0 %
   comments: CONFIDENCE LIMITS CAN NOT BE CALCULATED.

 06900945  sampled: 07/16/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901231  sampled: 08/20/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 01900194  sampled: 09/10/90     LC50:      70.8 %
   95% fid. limits:    61.7 -  81.2 %
   comments: MISA Audit

 06901443  sampled: 09/17/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901665  sampled: 10/15/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901921  sampled: 11/19/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

```
cooling water

process effluent

Dicy Cooling Water

 06900947  sampled: 07/16/90      non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901667  sampled: 10/15/90      non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

 06901923  sampled: 11/19/90      non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

COMPANY: Cyanamid Canada Inc.(Welland plant), Niagara Falls (1550102)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results from ten Daphnia magna acute lethality toxicity tests conducted on samples from Millers Creek (0100), and Dicy Cooling Water (01300) were submitted by Cyanamid Canada Inc. (Welland Plant) of Niagara Falls. Seven of eight samples from Millers Creek were acutely lethal to Daphnia, with 48 h LC50 values ranging from 24.5% to 90.6 %. The two samples of Dicy Cooling Water were not acutely lethal to Daphnia.

Millers Cr

```
 06900771  sampled: 06/18/90     LC50:       90.6 %
   95% fid. limits:    0.0 -    0.0 %
   comments: CONFIDENCE LIMITS CAN NOT BE CALCULATED

 06900772  sampled: 06/18/90     LC50:       24.5 %
   95% fid. limits:   20.0 -   30.0 %
   comments: 100% MORTALITY IN THE 30% CONCENTRATION

 06900944  sampled: 07/16/90     non-lethal
   95% fid. limits:    0.0 -    0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06901232  sampled: 08/20/90     LC50:       79.1 %
   95% fid. limits:   66.6 - 103.1 % slope:     7.5
   comments: 80% MORTALITY IN 100% TEST CONCENTRATION.

 02900194  sampled: 09/10/90     LC50:        5.0 -  15.0  %
   95% fid. limits:    0.0 -    0.0 %
   comments: MISA Audit

 06901444  sampled: 09/17/90     LC50:       77.9 %
   95% fid. limits:   72.9 -   83.2 %
   comments: 100% MORTALITY IN 100% TEST CONCENTRATION.

 06901666  sampled: 10/15/90     LC50:       72.7 %
   95% fid. limits:   65.7 -   80.3 %
   comments: 30% MORTALITY IN 65% TEST CONCENTRATION.

 06901922  sampled: 11/19/90     LC50:       77.9 %
   95% fid. limits:   72.9 -   83.1 %
   comments: 10% MORTALITY IN THE 65% CONCENTRATION
```

Cyanamid Canada Inc.(Welland plant) (continued)

cooling water

process effluent

Dicy Cooling Water

```
 06900948  sampled: 07/16/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

 06901924  sampled: 11/19/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

COMPANY: Exolon-Esk Company of Canada Ltd., Thorold (1640002)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on Beaver Dam Rd. Outfall effluent samples collected between June 1990 and November 1990, were provided by Exolon-Esk Company of Canada Limited. All six samples were not acutely lethal to test fish. A sample collected and tested by the Ministry in July had a 96 hour LC50 of > 100 %.

```
Outfall Beaver-Dam Rd

 03900470  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: Non lethal; single concentration test

 01900139  sampled: 07/09/90     LC50:  >100  %
   95% fid. limits:     0.0 -    0.0 %
   comments: MISA Audit

 03900584  sampled: 07/10/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: Single Concentration Test; non-lethal

 03900688  sampled: 08/14/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: Single Concentration Test; non-lethal

 03900805  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: Single Concentration Test; non-lethal

 03900890  sampled: 10/08/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: Single Concentration Test; non-lethal

 03900986  sampled: 11/12/90     non-lethal
   95% fid. limits:     0.0 -    0.0 %
   comments: Single conc. test; non lethal
```

COMPANY: Exolon-Esk Company of Canada Ltd., Thorold (1640002)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Outfall at Beaver Dam Road (0100) were submitted by Exolon-Esk Company of Canada Ltd. of Thorold. All six samples were non-lethal to Daphnia. A sample collected and tested by the Ministry in July had a LC50 of > 100 % effluent.

```
Outfall Beaver-Dam Rd

 03900470  sampled: 06/11/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: Non lethal

 02900139  sampled: 07/09/90     LC50:  >100   %
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit

 03900584  sampled: 07/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: Non-lethal

 03900688  sampled: 08/14/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: Non-lethal

 03900805  sampled: 09/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: Non-lethal

 03900890  sampled: 10/08/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: Non-lethal

 03900986  sampled: 11/12/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: Non-lethal
```

COMPANY: Explosive Technologies Int. Ltd., North Bay (80200)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

The data for two trout bioassays, conducted on Weir Discharge effluent samples collected between June 1990 and November 1990, were provided by Explosive Technologies International Limited. Both samples were determined not acutely lethal to test fish. A sample collected and tested by the Ministry in November was non-lethal.

Discharge at Weir

03900455 sampled: 06/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900824 sampled: 09/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

01900261 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

COMPANY: Explosive Technologies Int. Ltd., North Bay (80200)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

Results from two Daphnia magna acute lethality toxicity tests conducted on samples from Discharge at Weir (0100) were submitted by Explosive Technologies International Ltd. of North Bay. Both samples were not acutely lethal to Daphnia. A sample collected and tested by the Ministry in November was also non-lethal.

Discharge at Weir

```
03900455  sampled: 06/06/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: Non lethal

03900824  sampled: 09/18/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: Non-lethal

02900261  sampled: 11/13/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: MISA Audit; Non-lethal
```

COMPANY: Fiberglas Canada Inc., Sarnia
(270306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on main effluent samples collected between June 1990 and November 1990, were provided by Fiberglas Canada Incorporated. Five of the six samples were not acutely lethal. The remaining sample produced a 96 hour LC50 of > 100 % effluent.

Main Effluent

```
03900466  sampled: 06/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal; single concentration test

03900578  sampled: 07/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single concentration test; Non lethal

03900673  sampled: 08/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal; single concentration test

03900793  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900891  sampled: 10/08/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Conc. Test; 90% mort. @ 100% eff.con

03900980  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal
```

COMPANY: Fiberglas Canada Inc., Sarnia
(270306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for five Daphnia magna acute lethality toxicity tests conducted on samples of Main Effluent (0100) were submitted by Fibreglas Canada Inc. of Sarnia. Four of five samples were not acutely lethal to Daphnia. The October sample was acutely lethal to Daphnia, with an LC50 of 18.0 %.

Main Effluent

03900466 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900673 sampled: 08/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900793 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900891 sampled: 10/08/90 LC50: 18.0 %
95% fid. limits: 13.0 - 25.0 %
comments:

03900980 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

COMPANY: General Chemical Canada Ltd., Amherstburg (10009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for eleven trout bioassays, conducted on North Drain effluent and Main Drain effluent samples collected between June 1990 and November 1990, were provided by General Chemicals Canada Limited. All six samples of North Drain effluent were acutely lethal to the test fish. For these samples, the 96 Hour LC50s ranged from 22.6 % to 28.3 % effluent. Also a sample collected and tested by the Ministry in October was acutely lethal and had an LC50 of 14.1 %. Three of five Main Drain effluent samples were not acutely lethal to the test fish. The remaining two samples had LC50s of > 100 % effluent. A Main Drain effluent sample, collected and tested by the Ministry in October, was non-lethal.

North Drain

03900479 sampled: 06/12/90 LC50: 28.3 %
95% fid. limits: 20.0 - 40.0 %
comments: Lethal

03900587 sampled: 07/10/90 LC50: 22.6 %
95% fid. limits: 17.4 - 29.3 % slope: 5.5
comments:

03900690 sampled: 08/14/90 LC50: 25.3 %
95% fid. limits: 18.8 - 33.9 % slope: 5.5
comments:

03900804 sampled: 09/11/90 LC50: 28.3 %
95% fid. limits: 20.0 - 40.0 %
comments:

03900896 sampled: 10/09/90 LC50: 28.3 %
95% fid. limits: 20.0 - 40.0 %
comments:

01900226 sampled: 10/10/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: MISA Audit

03900988 sampled: 11/13/90 LC50: 25.3 %
95% fid. limits: 18.8 - 33.9 % slope: 5.5
comments:

General Chemical Canada Ltd. (continued)

Main Drain

```
03900480  sampled: 06/12/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single conc. test - 5% mort. @ 100% eff. conc

03900585  sampled: 07/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900691  sampled: 08/14/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; 5% mort @100% effl

03900803  sampled: 09/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

01900225  sampled: 10/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

03900989  sampled: 11/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

Intake Water

```
03900481  sampled: 06/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single concentration test; Non lethal

03900586  sampled: 07/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test;non-lethal

03900689  sampled: 08/14/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900802  sampled: 09/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900990  sampled: 11/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

COMPANY: General Chemical Canada Ltd., Amherstburg (10009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for twelve Daphnia magna acute lethality toxicity tests conducted on samples from North Drain and Main Drain effluent were submitted by General Chemical Canada Ltd. of Amherstburg. All six samples from the North Drain (0100) were acutely lethal to Daphnia, with LC50s between 7.9 % and 8.8 %. Four of six samples from the Main Drain (0200) were not acutely lethal to Daphnia and the remaining two samples had LC50s > 100%. A sample collected by the Ministry from the Main Drain effluent in October was acutely lethal to Daphnia and had a LC50 of 18.8 %. A sample collected by the Ministry from the North Drain effluent in October was acutely lethal and had a LC50 of 5.0 - 15.0 %.

North Drain

03900479 sampled: 06/12/90 LC50: 8.8 %
95% fid. limits: 6.0 - 13.0 %
comments:

03900587 sampled: 07/10/90 LC50: 7.9 %
95% fid. limits: 5.9 - 10.4 % slope: 5.5
comments:

03900690 sampled: 08/14/90 LC50: 8.5 %
95% fid. limits: 6.9 - 10.3 % slope: 9.3
comments:

03900804 sampled: 09/11/90 LC50: 7.9 %
95% fid. limits: 5.9 - 10.4 % slope: 5.5
comments:

03900896 sampled: 10/09/90 LC50: 8.8 %
95% fid. limits: 6.0 - 13.0 %
comments:

02900226 sampled: 10/10/90 LC50: 5.0 - 15.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit\High conductivity & pH

03900988 sampled: 11/13/90 LC50: 8.8 %
95% fid. limits: 6.0 - 13.0 %
comments:

General Chemical Canada Ltd. (continued)

Main Drain

```
03900480  sampled: 06/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900585  sampled: 07/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900691  sampled: 08/14/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900803  sampled: 09/11/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100

03900897  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non Lethal

02900225  sampled: 10/10/90     LC50:         18.8 %
  95% fid. limits:   13.9 -  26.3 %
  comments: MISA Audit

03900989  sampled: 11/13/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100
```

Intake Water

```
03900481  sampled: 06/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900586  sampled: 07/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900689  sampled: 08/14/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100

03900802  sampled: 09/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900898  sampled: 10/09/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non Lethal
```

General Chemical Canada Ltd. (continued)

```
03900990  sampled: 11/13/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100
```

COMPANY: ICI Canada Inc., Cornwall
(390401)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY
The data for four trout bioassays, conducted on LEL-2 effluent samples collected between June 1990 and November 1990, were provided by ICI Canada Inc. One of the four samples (collected in July) was acutely lethal to test fish and had a 96 hour LC50 of 84.5 %. The remaining three samples were non-lethal. A sample collected and tested by the Ministry in September had a LC50 of > 100 % effluent.

Effluent in LEL-2

```
06900673  sampled: 06/05/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900929  sampled: 07/10/90     LC50:      84.5 %
  95% fid. limits:   72.6 - 100.7 % slope:    11.7
  comments: 80% MORTALITY IN FULL STRENGTH EFFLUENT

06901107  sampled: 08/07/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901314  sampled: 09/04/90     non-lethal
  95% fid. limits:    0.0 -    0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900195  sampled: 09/10/90     LC50:  >100  %
  95% fid. limits:    0.0 -    0.0 %
  comments: MISA Audit
```

effluent in manhole 15

COMPANY: ICI Canada Inc., Cornwall
(390401)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results from six Daphnia magna acute lethality toxicity tests conducted on samples from Effluent in LEL-2 were submitted by ICI Canada Inc. Five of six samples were not acutely lethal to Daphnia magna. The remaining sample was acutely lethal to Daphnia and the LC50 was 39.0 %. A sample collected and tested by the Ministry in September was non-lethal.

Effluent in LEL-2

```
06900674  sampled: 06/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED

06900930  sampled: 07/10/90     LC50:      39.0 %
  95% fid. limits:   30.4 -  48.6 % slope:     4.7
  comments: 70% MORTALITY IN 50% TEST CONCENTRATION.

06901108  sampled: 08/07/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901315  sampled: 09/04/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02900195  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

06901509  sampled: 10/01/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901844  sampled: 11/06/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED
```

COMPANY: ICI Canada Inc., Courtright
(390203)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for six trout bioassays, conducted on plant final effluent samples collected between June 1990 and November 1990, were provided by ICI Canada Inc. All six samples were not acutely lethal to test fish. A sample collected and tested by the Ministry in August was also non-lethal.

Plant Final

```
05900141  sampled: 06/20/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

05900159  sampled: 07/18/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

01900169  sampled: 08/08/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: MISA Audit; Non-lethal

05900172  sampled: 08/15/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

05900200  sampled: 09/19/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

05900207  sampled: 10/17/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

05900215  sampled: 11/21/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:
```

COMPANY: ICI Canada Inc., Courtright
(390203)
(formerly CIL Inc.)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY
Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Plant Final Effluent (0200) were submitted by ICI Canada Inc. All six samples were not acutely lethal to Daphnia. A sample collected and tested by the Ministry in August had a 48 h LC50 > 100%.

Plant Final

05900141 sampled: 06/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900159 sampled: 07/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02900169 sampled: 08/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

05900172 sampled: 08/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900200 sampled: 09/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900207 sampled: 10/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900215 sampled: 11/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: International Minerals & Chemicals, Port Maitland (1500008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between June 1990 and November 1990, were provided by International Minerals and Chemicals. All six samples were non-lethal to test fish.

Final Effluent

```
03900468  sampled: 06/11/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal; single concentraion test

03900603  sampled: 07/16/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal;single concentration test

03900653  sampled: 08/07/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Single Concentration Test; non-lethal

03900806  sampled: 09/10/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal; single concentration test

03900907  sampled: 10/15/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal; single concentration test

03900987  sampled: 11/12/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal
```

COMPANY: International Minerals & Chemicals, Port Maitland (1500008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (0300) were submitted by International Minerals and Chemicals of Port Maitland. Four of six samples were not acutely lethal to Daphnia, and one sample had 48 h LC50 > 100%. The sample collected in June was acutely lethal to Daphnia and the LC50 range was 50 - 100 %.

Final Effluent

```
03900468  sampled: 06/11/90     LC50:      50.0 - 100.0  %
  95% fid. limits:    0.0 -   0.0 %
  comments:

03900603  sampled: 07/16/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100

03900653  sampled: 08/07/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900806  sampled: 09/10/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900907  sampled: 10/15/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non Lethal

03900987  sampled: 11/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal
```

COMPANY: Liquid Carbonic Inc., Courtright
(36250306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for seven trout bioassays, conducted on South ditch effluent samples collected between June 1990 and January 1991, were provided by Liquid Carbonic Incorporated. One of the seven samples, collected in June, was acutely lethal to test fish and had a LC50 of 13.0 %. A sample collected in January 1991 had a LC50 of > 100 % effluent. The remaining five samples were non-lethal. A sample collected and tested by the Ministry in September had a LC50 of > 100 %.

Effluent to South Ditch

```
08900703  sampled: 06/20/90     LC50:       13.0 %
  95% fid. limits:     0.0 -   0.0 %
  comments:

08900831  sampled: 07/18/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901011  sampled: 08/22/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

01900196  sampled: 09/12/90     LC50:  >100   %
  95% fid. limits:     0.0 -   0.0 %
  comments: MISA audit sample.

08901151  sampled: 09/19/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901641  sampled: 11/21/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901863  sampled: 12/11/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08910191  sampled: 01/23/91     LC50:  >100   %
  95% fid. limits:     0.0 -   0.0 %
  comments:
```

COMPANY: Liquid Carbonic Inc., Courtright
(36250306)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for eight Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to South Ditch (0100) were submitted by Liquid Carbonic Inc. of Courtright. Four of the eight samples were not acutely lethal to Daphnia and three samples have LC50s of > 100 % effluent. The sample collected in June was acutely lethal to Daphnia and the LC50 was 16.8 %. A sample collected and tested by the Ministry in September was non-lethal.

Effluent to South Ditch

```
08900704  sampled: 06/20/90     LC50:      16.8 %
  95% fid. limits:   15.6 -  17.9 %
  comments:

08900832  sampled: 07/18/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

08901012  sampled: 08/22/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:

02900196  sampled: 09/12/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

08901152  sampled: 09/19/90     LC50:  >100   %
  95% fid. limits:    0.0 -   0.0 %
  comments:

08901392  sampled: 10/24/90     LC50:  >100   %
  95% fid. limits:    0.0 -   0.0 %
  comments:

08901642  sampled: 11/21/90     LC50:  >100   %
  95% fid. limits:    0.0 -   0.0 %
  comments:

08901864  sampled: 12/11/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:
```

Liquid Carbonic Inc. (continued)

```
08910192  sampled: 01/23/91     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments:
```

COMPANY: Liquid Carbonic Inc., Maitland
(36250108)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for seven trout bioassays, conducted on Main Outfall effluent samples collected between June 1990 and January 1991, were provided by Liquid Carbonic Incorporated. Six of the seven samples were not acutely lethal to test fish. The remaining sample, collected in January 1991, had a LC50 of > 100 % effluent. A sample collected and tested by the Ministry in October had a LC50 of > 100 % effluent.

Effluent to Main Outfall

```
08900701   sampled: 06/20/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08900833   sampled: 07/17/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901001   sampled: 08/21/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %     $
  comments: $

08901251   sampled: 09/26/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

05900211   sampled: 10/10/90     LC50:   >100   %
  95% fid. limits:     0.0 -   0.0 %
  comments: MISA audit sample.

08901393   sampled: 10/24/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901861   sampled: 12/12/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08910151   sampled: 01/16/91     LC50:   >100   %
  95% fid. limits:     0.0 -   0.0 %
  comments:
```

COMPANY: Liquid Carbonic Inc., Maitland
(36250108)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results for seven Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to Main Outfall (0100) were submitted by Liquid Carbonic Inc. of Maitland. Five of the sevensamples were not acutely lethal to Daphnia, and the other two samples have 48 h LC50s of > 100% effluent.

Effluent to Main Outfall

08900702 sampled: 06/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08901002 sampled: 08/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

08901252 sampled: 09/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900211 sampled: 10/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

08901394 sampled: 10/24/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

08901682 sampled: 11/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08901862 sampled: 12/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08910152 sampled: 01/16/91 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Nitrochem Inc., Maitland
(1710003)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between June 1990 and November 1990, were provided by Nitrochem Incorporated. All six samples were acutely lethal to the test fish. The 96 hour LC50s ranged from 3.1 % to 14.1 % effluent.

Final Effluent

```
03900482  sampled: 06/12/90     LC50:      14.1 %
  95% fid. limits:   10.0 -  20.0 %
  comments: Lethal

03900589  sampled: 07/10/90     LC50:       7.1 %
  95% fid. limits:    5.0 -  10.0 %
  comments:

03900700  sampled: 08/14/90     LC50:       3.1 %
  95% fid. limits:    2.1 -   4.5 % slope:     4.5
  comments:

03900807  sampled: 09/11/90     LC50:      14.1 %
  95% fid. limits:   10.0 -  20.0 %
  comments:

03900895  sampled: 10/09/90     LC50:       3.5 %
  95% fid. limits:    2.5 -   5.0 %
  comments:

03900966  sampled: 11/06/90     LC50:       6.3 %
  95% fid. limits:    4.7 -   8.5 % slope:     5.5
  comments:
```

COMPANY: Nitrochem Inc., Maitland
(1710003)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (0400) were submitted by Nitrochem Inc. of Maitland. All six samples were acutely lethal to Daphnia with 48 h LC50s between 4.7 % and 18.0 %.

Final Effluent

```
03900482  sampled: 06/12/90     LC50:       10.6 %
  95% fid. limits:    4.8 -  16.2 % slope:      2.2
  comments:

03900589  sampled: 07/10/90     LC50:       14.5 %
  95% fid. limits:   10.9 -  19.2 % slope:      4.5
  comments:

03900700  sampled: 08/14/90     LC50:        4.7 %
  95% fid. limits:    3.4 -   6.3 % slope:      4.1
  comments:

03900807  sampled: 09/11/90     LC50:        5.6 %
  95% fid. limits:    3.6 -   8.5 % slope:      2.5
  comments:

03900895  sampled: 10/09/90     LC50:       12.7 %
  95% fid. limits:   10.0 -  16.0 % slope:      5.6
  comments:

03900966  sampled: 11/06/90     LC50:       18.0 %
  95% fid. limits:   13.0 -  25.0 %
  comments:
```

COMPANY: Norton Canada Inc., Niagara Falls
(1650001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for eighteen trout bioassays, conducted on Sewer B, C and D effluent samples collected between June 1990 and November 1990, were provided by Norton Canada Incorporated. Five of the six samples collected from Sewer B were not acutely lethal to the test fish. The remaining sample had a LC50 of > 100 % effluent. A sample collected and tested by the Ministry had a LC50 of > 100 %. Four of the six Sewer C samples were non-lethal. A sample collected in September was acutely lethal to test fish. The 96 hour LC50 was 65 % - 100 % effluent. All six Sewer D samples were non-lethal.

Sewer B

```
03900476  sampled: 06/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single concentration test; Non lethal

03900569  sampled: 07/04/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; 5% mort. @ 100%

01900150  sampled: 07/23/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit

03900657  sampled: 08/08/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900771  sampled: 09/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900875  sampled: 10/02/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900944  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

Norton Canada Inc. (continued)

Sewer C

```
03900477  sampled: 06/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900570  sampled: 07/04/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; 100% mort. @ 100%

03900658  sampled: 08/08/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900772  sampled: 09/05/90     LC50:       65.0 - 100.0  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100

03900876  sampled: 10/02/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900945  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal
```

Sewer D

```
03900478  sampled: 06/13/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single concentration Test; Non lethal

03900571  sampled: 07/04/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; Non lethal

03900659  sampled: 08/08/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900773  sampled: 09/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900877  sampled: 10/02/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; Non-lethal

03900946  sampled: 11/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration test; non-lethal
```

COMPANY: Norton Canada Inc., Niagara Falls
(1650001)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for eighteen Daphnia magna acute lethality toxicity tests conducted on samples from three separate outfalls were submitted by Norton Canada Inc. of Niagara Falls. Four of the six samples from Sewer B (#200) were not acutely lethal to Daphnia, and the other two samples have 48 h LC50s > 100%. A sample collected and tested by the Ministry in July also had a LC50 of > 100 %. Three of the six samples from Sewer C (0300) were non-lethal, and the other three samples have LC50s of > 100%. Four of the six samples from Sewer D (0400) were non-lethal and the other two samples have LC50s of > 100 % effluent.

Sewer B

03900476 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900569 sampled: 07/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 > 100

02900150 sampled: 07/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03900657 sampled: 08/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900771 sampled: 09/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900875 sampled: 10/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900944 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Norton Canada Inc. (continued)

Sewer C

03900477 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900570 sampled: 07/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 > 100

03900658 sampled: 08/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900772 sampled: 09/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900876 sampled: 10/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900945 sampled: 11/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Sewer D

03900478 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900571 sampled: 07/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 > 100

03900659 sampled: 08/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900773 sampled: 09/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900877 sampled: 10/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900946 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

COMPANY: Partek Insulations Ltd., Sarnia
(20150009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for two trout bioassays, conducted on C Water Overflow samples collected between June 1990 and November 1990, were provided by Partek Insulations Limited. Both samples were acutely lethal to the test fish . The measured 96 hour LC50s were 51.1 % and 44.3 % effluent.

C Water Overflow

```
05900187  sampled: 08/27/90     LC50:      51.1 %
  95% fid. limits:   41.2 -  63.5 % slope:     3.0
  comments: Probit Program by J.T.Trevors 1986

05900217  sampled: 11/26/90     LC50:      44.3 %
  95% fid. limits:   36.3 -  53.8 %
  comments:
```

COMPANY: Partek Insulations Ltd., Sarnia
(20150009)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for two Daphnia bioassays conducted on C water Overflow samples were provided by Partek Insulations Ltd. Both samples were acutely lethal to Daphnia. The LC50s were 70.8 % and 19.6 %.

C Water Overflow

```
05900187  sampled: 08/27/90     LC50:      70.8 %
  95% fid. limits:   59.1 -  84.9 % slope:     4.5
  comments: Probit Program by J.T.Trevors 1986

05900217  sampled: 11/26/90     LC50:      19.6 %
  95% fid. limits:   18.1 -  21.3 %
  comments:
```

COMPANY: Puritan-Bennett Canada Ltd., Maitland (36910008)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for two trout bioassays, conducted Effluent to Creek samples collected between June 1990 and December 1990, were provided by Puritan-Bennett Canada Limited. Both samples were acutely lethal to the test fish. The 96 hour LC50s were 59.2 % and 43.2 %.

Effluent to Creek

16900026 sampled: 09/19/90 LC50: 59.2 %
95% fid. limits: 59.1 - 59.1 %
comments:

16900045 sampled: 12/18/90 LC50: 43.3 %
95% fid. limits: 35.4 - 52.7 %
comments:

COMPANY: Puritan-Bennett Canada Ltd., Maitland (36910008)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Effluent to Creek

16900021 sampled: 09/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO LC-50 DUE TO >50% SURVIVAL AT 100% CONC.

16900035 sampled: 12/18/90 LC50: 93.5 %
95% fid. limits: 80.8 - 129.2 %
comments: SLOPE = 8.605479

Rain Gauge

Intake Water

COMPANY: Stanchem, Cornwall
(391508)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

The data for four trout bioassays, conducted on Conpac effluent samples collected between June 1990 and November 1990, were provided by Stanchem. Two of the four samples were non-lethal and the other two samples produced LC50s of > 100 % effluent. A sample collected and tested by the Ministry in August was non-lethal.

Effluent from Conpac

```
06900675  sampled: 06/05/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: 20% MORTALITY IN THE 100% CONCENTRATION

06900832  sampled: 07/04/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

01900168  sampled: 08/08/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

06901105  sampled: 08/08/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901316  sampled: 09/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED
```

COMPANY: Stanchem, Cornwall
(391508)
SECTOR: Inorganic Chemical
REGION: Southeast

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Effluent from Conpac (0100) were submitted by Stanchem of Cornwall. Three of the six samples were non-lethal to Daphnia and one sample had a LC50 of > 100 % effluent. Two samples, collected in July and November, were acutely lethal to Daphnia and the LC50s were 0.2 % and 24.5 %. A sample collected and tested by the Ministry in August was non-lethal.

Effluent from Conpac

```
06900676  sampled: 06/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

06900836  sampled: 07/04/90     LC50:        0.2 %
  95% fid. limits:    0.1 -   0.2 % slope:     8.3
  comments: CONDUCTIVITY IN 100% CONC. MUST BE MULTIPLIED

06901106  sampled: 08/08/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT

02900168  sampled: 08/08/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Many Floaters

06901317  sampled: 09/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: CONDUCTIVITY IN 100% TO BE MULTIPLIED BY 10.

06901511  sampled: 10/02/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901842  sampled: 11/07/90     LC50:       24.5 %
  95% fid. limits:   20.0 -  30.0 %
  comments: 100% MORTALITY IN THE 30% CONCENTRATION
```

COMPANY: Sulco Chemicals Ltd., Elmira
(85750008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for five trout bioassays, conducted on final effluent samples collected between June 1990 and November 1990, were provided by Sulco Chemicals Limited. All five samples were not acutely lethal to the test fish.

Final Effluent

08900691 sampled: 06/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900811 sampled: 07/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08900961 sampled: 08/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08901241 sampled: 09/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08901451 sampled: 10/31/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Sulco Chemicals Ltd., Elmira
(85750008)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (0100) were submitted by Sulco Chemicals Ltd. of Elmira. Four of six samples were not acutely lethal to Daphnia, and two samples have 48 h LC50s > 100 %.

Final Effluent

```
08900692  sampled: 06/20/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08900812  sampled: 07/18/90     LC50:  >100  %
  95% fid. limits:     0.0 -   0.0 %
  comments:

08900962  sampled: 08/15/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901242  sampled: 09/26/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901452  sampled: 10/31/90     LC50:  >100  %
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901672  sampled: 11/21/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:
```

COMPANY: UCAR Carbon Canada Ltd., Welland
(380204)
(formerlyUnion Carbide Inc.)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for fourteen trout bioassays, conducted on # 2 weir effluent, Government Dock effluent, and Pump House Return effluent samples collected between June 1990 and November 1990, were provided by UCAR Carbon Canada Ltd. One of two samples from the # 2 weir effluent was not acutely lethal. The other sample produced a LC50 result of > 100 % effluent. All six Government Dock samples were non-lethal. A sample collected and tested by the Ministry in July was also non-lethal. Five of the six samples of Pump House Return effluent was non-lethal, and the remaining sample produced a 96 hour LC50 result of > 100 % effluent. A sample collected from Pump House Return effluent and tested by the Ministry in July was also non-lethal.

#2 Weir Effluent

```
03900566  sampled: 07/03/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; Non lethal

03900868  sampled: 10/01/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: LC50 >100
```

Government Dock Effluent

```
03900434  sampled: 06/04/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900567  sampled: 07/03/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; Non lethal

01900142  sampled: 07/16/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

03900651  sampled: 08/07/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900768  sampled: 09/04/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

UCAR Carbon Canada Ltd. (continued)

```
03900869  sampled: 10/01/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal; single concentration test

03900954  sampled: 11/05/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

Pump House Return Effl

```
03900435  sampled: 06/04/90      LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; 5%mort @100%

03900568  sampled: 07/03/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; Non lethal

01900143  sampled: 07/16/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Non-lethal

03900652  sampled: 08/07/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900770  sampled: 09/04/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal

03900867  sampled: 10/01/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non Lethal; single concentration test

03900955  sampled: 11/05/90      non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Single Concentration Test; non-lethal
```

COMPANY: UCAR Carbon Canada Ltd., Welland
(380204)
(formerly Union Carbide Inc.)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results from twelve Daphnia magna acute lethality toxicity tests conducted on samples from three separate outfalls were submitted by UCAR Carbon Canada Limited. One of two samples from the #2 Weir Effluent (0100) was not acutely lethal to Daphnia and the other had LC50 of > 100 % effluent. All five samples of Government Dock Effluent (0200) were non-lethal. All five samples of Pump House Return Efluent (0300) were non-lethal. Samples of Government Dock effluent and Pump House Return effluent were tested by the Ministry and both were non-lethal.

#2 Weir Effluent

03900566 sampled: 07/03/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 21% mortality @ 100% effluent concentration

03900868 sampled: 10/01/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Government Dock Effluent

03900434 sampled: 06/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900567 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

02900142 sampled: 07/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03900651 sampled: 08/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900768 sampled: 09/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

UCAR Carbon Canada Ltd. (continued)

```
 03900869  sampled: 10/01/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal
```

Pump House Return Effl

```
 03900435  sampled: 06/04/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non lethal

 03900568  sampled: 07/03/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non lethal

 02900143  sampled: 07/16/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: MISA Audit

 03900652  sampled: 08/07/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03900770  sampled: 09/04/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal

 03900867  sampled: 10/01/90     non-lethal
   95% fid. limits:    0.0 -   0.0 %
   comments: Non-lethal
```

COMPANY: Union Carbide Canada Ltd., Moore TWP
(381608)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for eight trout bioassays, conducted on final effluent samples collected between June 1990 and January 1991, were provided by Union Carbide Canada Limited. Seven of the eight samples were non-lethal and the remaining had a LC50 of > 100 % effluent. A sample collected and tested by the Ministry in October was also non-lethal.

Final Effluent

```
 08900713  sampled: 06/26/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08900881  sampled: 07/31/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08901021  sampled: 08/28/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08901191  sampled: 09/25/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 01900228  sampled: 10/10/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit; Non-lethal

 08901413  sampled: 10/29/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08901703  sampled: 11/26/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08910011  sampled: 12/31/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08910221  sampled: 01/29/91     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:
```

COMPANY: Union Carbide Canada Ltd., Moore TWP
(381608)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for eight Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (0100) were submitted by Union Carbide Canada Ltd. of Moore Township. Six of eight samples were not acutely lethal to Daphnia. The sample collected in August had a LC50 of > 100 % effluent. The sample collected in January 1991 was acutely lethal and had a LC50 of 70.7 % effluent. A sample collected and tested by the Ministry in October had a LC50 of > 100 % effluent.

Final Effluent

```
08900714  sampled: 06/26/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08900882  sampled: 07/31/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901022  sampled: 08/28/90     LC50:   >100   %
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901192  sampled: 09/25/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

02900228  sampled: 10/10/90     LC50:   >100   %
  95% fid. limits:     0.0 -   0.0 %
  comments: MISA Audit

08901414  sampled: 10/29/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08901704  sampled: 11/26/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08910012  sampled: 12/31/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments:

08910222  sampled: 01/29/91     LC50:       70.7 %
  95% fid. limits:    57.2 -  87.3 % slope:     9.2
  comments:
```

COMPANY: Union Carbide Canada Ltd., Sarnia
(381509)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for eight trout bioassays, conducted on Cole Drain effluent samples collected between June 1990 and January 1991, were provided by Union Carbide Canada Limited. Four of the eight samples were non-lethal and the other four samples had LC50 results of > 100 % effluent. A sample collected and tested by the Ministry in October was non-lethal.

Effluent to Cole Drain

```
08900711  sampled: 06/26/90     LC50:  >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments:

08900883  sampled: 07/31/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

08901031  sampled: 08/28/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

08901193  sampled: 09/25/90     LC50:  >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments:

01900227  sampled: 10/10/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: MISA Audit; Non-lethal

08901411  sampled: 10/29/90     LC50:  >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments:

08901701  sampled: 11/26/90     LC50:  >100   %
  95% fid. limits:     0.0 -    0.0 %
  comments:

08910015  sampled: 12/31/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:

08910223  sampled: 01/29/91     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments:
```

COMPANY: Union Carbide Canada Ltd., Sarnia
(381509)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for eight Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to Cole Drain (0100) were submitted by Union Carbide Canada Ltd. of Sarnia. Six of the eight samples were acutely lethal to Daphnia and the LC50s ranged from 32.7 % to 91.2 %. The remaining two samples have LC50s of > 100 % effluent.

Effluent to Cole Drain

```
 08900712  sampled: 06/26/90     LC50:       32.7 %
   95% fid. limits:   26.0 -  40.9 %
   comments:

 08900884  sampled: 07/31/90     LC50:   >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 08901032  sampled: 08/28/90     LC50:       61.4 %
   95% fid. limits:   48.7 -  77.4 %
   comments:

 08901194  sampled: 09/25/90     LC50:       82.0 %
   95% fid. limits:   46.5 - 394.6 % slope:      1.6
   comments:

 08901412  sampled: 10/29/90     LC50:   >100   %
   95% fid. limits:    0.0 -   0.0 %
   comments:

 08901702  sampled: 11/26/90     LC50:       91.2 %
   95% fid. limits:   70.1 - 160.5 % slope:      5.4
   comments:

 08910014  sampled: 12/31/90     LC50:       78.6 %
   95% fid. limits:   54.9 - 164.1 % slope:      2.9
   comments:

 08910224  sampled: 01/29/91     LC50:       35.4 %
   95% fid. limits:   35.3 -  35.3 %
   comments:
```

COMPANY: Union Carbide Canada Ltd., Sault Ste. Marie
(381202)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

The data for six trout bioassays, conducted on samples of effluent discharging to Outfall at SD collected between June 1990 and January 1991, were provided by Union Carbide Canada Limited. Four of the six samples were not acutely lethal and the remaining two samples had LC50 results of > 100 % effluent. A sample collected and tested by the Ministry in July had a LC50 result of > 100 % effluent

---

Effluent to Outfall at SD

```
 08900721  sampled: 06/26/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: Mortality appeared natural.

 01900145  sampled: 07/17/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments: MISA Audit

 08900911  sampled: 07/31/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08901041  sampled: 08/27/90     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08901441  sampled: 10/29/90     LC50:  >100  %
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08910021  sampled: 01/01/91     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:

 08910231  sampled: 01/28/91     non-lethal
   95% fid. limits:     0.0 -   0.0 %
   comments:
```

COMPANY: Union Carbide Canada Ltd., Sault Ste. Marie (381202)
SECTOR: Inorganic Chemical
REGION: Northeast

SUMMARY

Results from six Daphnia magna acute lethality toxicity tests conducted on samples of Effluent to Outfall at SD (0100) were submitted Union Carbide Canada Ltd. of Sault Ste. Marie. The sample collected in October was acutely lethal to Daphnia and had a LC50 of 60.5 %. Of the remaining samples, three were non-lethal and two samples had LC50s of > 100 % effluent. One of the two samples collected and tested by the Ministry was acutely lethal to Daphnia and the LC50 was 63.3 % . The other sample had a LC50 of > 100 % effluent.

Effluent to Outfall at SD

08900722 sampled: 06/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02900145 sampled: 07/17/90 LC50: 63.3 %
95% fid. limits: 53.7 - 74.6 %
comments: MISA Audit

08900912 sampled: 07/31/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

08901042 sampled: 08/27/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

02900227 sampled: 10/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit/Circling reaction in 5% conc.

08901442 sampled: 10/29/90 LC50: 60.5 %
95% fid. limits: 49.7 - 73.5 %
comments:

08910022 sampled: 01/01/91 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

08910232 sampled: 01/28/91 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Washington Mills Electro Minerals, Niagara Falls (1660000)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for twelve trout bioassays, conducted on Queen Lagoon effluent, and Old Lagoon effluent samples collected between June 1990 and November 1990, were provided by Washington Mills Electro Minerals. All twelve Queen Lagoon effluent and Old Lagoon effluent samples were not acutely lethal. Samples collected and tested by the Ministry from both Queen Lagoon and Old Lagoon effluent were non-lethal.

Queen Lagoon Effluent

03900453 sampled: 06/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal; single concentration test

01900134 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

03900563 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; Non lethal

03900655 sampled: 08/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900765 sampled: 09/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal; single concentration test

03900880 sampled: 10/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900962 sampled: 11/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

Old Lagoon Effluent

03900452 sampled: 06/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal; single concentration test

Washington Mills Electro Minerals (continued)

```
03900564  sampled: 07/03/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Single Concentration Test; Non lethal

01900135  sampled: 07/03/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: MISA Audit; Non-lethal

03900656  sampled: 08/07/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Single concentration test; non-lethal

03900766  sampled: 09/05/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal; single concentration test

03900879  sampled: 10/02/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Non lethal

03900963  sampled: 11/06/90     non-lethal
  95% fid. limits:     0.0 -    0.0 %
  comments: Single Concentration Test; non-lethal
```

COMPANY: Washington Mills Electro Minerals, Niagara Falls (1660000)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for twelve Daphnia magna acute lethality toxicity tests conducted on samples of Queen Lagoon Effluent (#100) and Old Lagoon Effluent (0200) were submitted by Washington Mills Electro Minerals of Niagara Falls. Four of six samples of Queen Lagoon Effluent were not acutely lethal to Daphnia and the remaining two samples have LC50s of > 100%. Five of six samples of Old Lagoon Effluent were non-lethal, and one sample had an LC50 > 100 %. A sample from each discharge was collected and tested by the Ministry in July and both produced LC50 results of > 100 % effluent.

Queen Lagoon Effluent

```
03900453  sampled: 06/05/90     LC50:  >100  %
  95% fid. limits:     0.0 -   0.0 %
  comments:

03900563  sampled: 07/03/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: Non lethal

02900134  sampled: 07/03/90     LC50:  >100  %
  95% fid. limits:     0.0 -   0.0 %
  comments: MISA Audit

03900655  sampled: 08/07/90     LC50:  >100  %
  95% fid. limits:     0.0 -   0.0 %
  comments: LC50 >100

03900765  sampled: 09/05/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: Non lethal

03900880  sampled: 10/02/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: Non-lethal

03900962  sampled: 11/06/90     non-lethal
  95% fid. limits:     0.0 -   0.0 %
  comments: Non-lethal
```

Old Lagoon Effluent

```
03900452  sampled: 06/05/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments:

02900135  sampled: 07/03/90     LC50:  >100  %
  95% fid. limits:    0.0 -   0.0 %
  comments: MISA Audit; Many floaters over all conc.

03900564  sampled: 07/03/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900656  sampled: 08/07/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900766  sampled: 09/05/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non lethal

03900879  sampled: 10/02/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal

03900963  sampled: 11/06/90     non-lethal
  95% fid. limits:    0.0 -   0.0 %
  comments: Non-lethal
```

COMPANY: Washington Mills Ltd., Niagara Falls (1950005)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

The data for six trout bioassays, conducted on final effluent samples collected between June 1990 and November 1990, were provided by Washington Mills Limited. All six samples were not acutely lethal to the test fish. A sample collected and tested by the Ministry in July was also non-lethal.

Final Effluent

03900454 sampled: 06/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

03900565 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; Non lethal

01900138 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

03900654 sampled: 08/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900767 sampled: 09/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal; single concentration test

03900878 sampled: 10/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

03900961 sampled: 11/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Single Concentration Test; non-lethal

COMPANY: Washington Mills Ltd., Niagara Falls (1950005)
SECTOR: Inorganic Chemical
REGION: West Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Final Effluent (0100) were submitted by Washington Mills Ltd. of Niagara Falls. Three of six samples were not acutely lethal to Daphnia and the other three samples have LC50s > 100 %. A sample collected and tested by the Ministry in July had a LC50 of > 100 % effluent.

Final Effluent

03900454 sampled: 06/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900565 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

02900138 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Very High Conductivity

03900654 sampled: 08/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900767 sampled: 09/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900878 sampled: 10/02/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900961 sampled: 11/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

COMPANY: Welland Chemical Ltd., Sarnia
(18530006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

The data for ten trout bioassays, conducted on samples collected from South Lagoon effluent, # 1 Lagoon effluent, Chlorine Fill UN effluent , Alum Chloride E Wall, and Alum Chloride W Wall discharges between December 1989 and May 1990, were provided by Welland Chemical Limited. Three of four South Lagoon effluent samples were acutely lethal to the test fish. The 96 hour LC50s were 62.8 %, 29.2 % and 36.0 % effluent. The remaining sample had a LC50 result of > 100 % effluent. Two of the three # 1 Lagoon effluent samples were non-lethal. The other sample had a LC50 of > 100 % effluent. The Chlorine Fill UN effluent and Alum Chloride W Wall effluent samples were both non-lethal to test fish. The Alum Chloride E Wall effluent sample had a LC50 result of > 100 % effluent.

South Lagoon Effluent

05900142 sampled: 06/20/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 100% X 10

05900146 sampled: 07/09/90 LC50: 62.8 %
95% fid. limits: 55.5 - 70.6 % slope: 16.8
comments: 100%, 75% Cconcentration Cond. multiple by 10

05900186 sampled: 08/22/90 LC50: 29.2 %
95% fid. limits: 20.7 - 41.3 %
comments:

05900218 sampled: 11/26/90 LC50: 36.0 %
95% fid. limits: 25.9 - 45.8 %
comments: 100,75,56% X Conductivity by 10

#1 Lagoon Effluent

05900161 sampled: 07/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900203 sampled: 10/01/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900216 sampled: 11/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Welland Chemical Ltd. (continued)

Chlorine Fill UN Effluent

05900148 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Alum Chloride E Wall

05900149 sampled: 07/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Alum Chloride W Wall

05900150 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Welland Chemical Ltd., Sarnia
(18530006)
SECTOR: Inorganic Chemical
REGION: Southwest

SUMMARY

Results for ten Daphnia magna acute lethality toxicity tests conducted on samples from five separate discharge points and one intake site were submitted by Welland Chemicals Ltd. of Sarnia. Four samples of South Lagoon Effluent (0100) were acutely lethal to Daphnia and have LC50s between 19.6 % and 61.5 % effluent. The three samples of #1 Lagoon Effluent (0200) were non-lethal. One sample of Chlorine Fill UN Effluent (0300) had a LC50 of 31.3 %. One sample from the Alum Chloride E Wall (0400) had a LC50 of 40.3 %. One sample from the Alum Chloride W Wall (0500) had a LC50 of 70.8 %.

South Lagoon Effluent

05900142 sampled: 06/20/90 LC50: 59.8 %
95% fid. limits: 50.4 - 70.7 %
comments: 100% Multiply by 10

05900146 sampled: 07/09/90 LC50: 46.7 %
95% fid. limits: 36.9 - 59.1 %
comments: 100% Conc. Conductivity Multiple by 10

05900186 sampled: 08/22/90 LC50: 61.5 %
95% fid. limits: 49.8 - 83.9 %
comments:

05900218 sampled: 11/26/90 LC50: 19.6 %
95% fid. limits: 18.1 - 21.3 %
comments: 100% & 50% X Conductivity by 10

#1 Lagoon Effluent

05900161 sampled: 07/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900203 sampled: 10/01/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05900216 sampled: 11/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Welland Chemical Ltd. (continued)

Chlorine Fill UN Effluent

```
 05900148  sampled: 07/10/90     LC50:        31.3 %
   95% fid. limits:   28.7 -  34.2 % slope:      6.7
   comments: Probit Program by J.T.Trevors (1986)
```

Alum Chloride E Wall

```
 05900149  sampled: 07/10/90     LC50:        40.3 %
   95% fid. limits:   33.9 -  46.1 %
   comments:
```

Alum Chloride W Wall

```
 05900150  sampled: 07/10/90     LC50:        70.8 %
   95% fid. limits:   59.1 -  84.8 % slope:      4.5
   comments: Probit Program by J.T. Tevors (1986)
```